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(54) **MATERIAL REMOVAL SYSTEM FOR USE WITH ARTICLES HAVING VARIATIONS IN FORM**

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See application file for complete search history.

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(57) **ABSTRACT**

A method of removing unwanted material from an article having a variable form can include scanning the article and determining, based on the scanning, a location of the unwanted material, determining tool paths of a cutting tool which will result in removal of the unwanted material, and displacing the cutting tool along the tool paths, thereby removing the unwanted material. A material removal system for removing unwanted material from an oilfield drill bit can include a rotary indexing device which rotates the drill bit about a longitudinal axis of the drill bit, a scanning device which scans an outer surface of the drill bit, and a controller which determines a geometry of the drill bit, based on at least one scan by the scanning device, determines a location of the unwanted material, and determines tool paths of a cutting tool for removal of the unwanted material.

34 Claims, 9 Drawing Sheets